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SB ALL @ AMSAT $ANS-238.01
MICROSAT TESTING SCHEDULED

HR AMSAT NEWS SERVICE BULLETIN 238.01 FROM AMSAT HQ
SILVER SPRING, MD AUGUST 26, 1989
TO ALL RADIO AMATEURS BT

Martin-Marietta To Donate The Use Of Facilities For MICROSAT Testing

This week the Martin-Marietta Astronautics Group (MMAG) of Denver, CO informed AMSAT-NA officials that it will donate its facilities for the testing of the four MICROSAT satellites scheduled to begin September 9th and finishing on September 22nd. AMSAT-NA will have the use of a 5 ft diameter by 10 ft long thermal vacuum test chamber for five days in order to "space" qualify the MICROSATs. All four of the MICROSATs will be mounted inside the chamber and will be tested in a simulated space environment, that is, in a "vacuum" and between temperatures from -20 degrees C to +55 degrees C. During the five day test, the chamber temperature will be "cycled" from hot to cold with 12 hour "dwells" at each of the temperature extremes. These "dwell" periods will provide an opportunity for the MICROSAT test team to see how well the entire spacecraft will perform. Also, all RF and power cabling will be routed to the outside of the chamber using special "feedthrough" connectors. With the RF cabling for the transmitters and receivers available for each of the MICROSATS, additional cabling will be provided to connect the MICROSAT trans-ponders to antennas that will be mounted on the roof of the ten story Space Simulation Laboratory (SSL) building at the Martin-Marietta plant. Installed specially on the roof of SSL building for the MICROSAT testing will be a collection of 2M and 70cm antennas. Located a mile north of the SSL building is the Martin-Marietta amateur radio club hamshack which will become for a week the MICROSAT command, control, and test "monitoring" center. From this remote location, all telemetry monitoring and vehicle commanding will be performed. Another unique aspect of of this arrangement is that the OSCAR satellite enthusiasts in the Denver area will be invited to participate in this testing. At specified times, amateurs in the Denver area will be allowed to use the MICROSATs as if they were on-orbit! Through the efforts of AA0P and WD0E, no less than a dozen stations will be ready to "hit" the PACSATs simultaneously with packets using TAPR PSK demodulators connected to their packet radio stations and their OSCAR-13 Mode B equipment. While the thermal vacuum test is in progress, the members of the Martin-Marietta radio club will be acting as hosts during the many long hours that the AMSAT team will be putting in to support this vital test. Also, a considerable level of technical, engineering, and logistical support, will be made available by club members and company employees. Jeff Ownings (N0IZN), President of the radio club at Martin-Marietta says that on behalf of the members of the club: "We are honored and privileged to once again support the AMSAT organization during thermal vacuum testing." When the thermal vacuum testing is completed on September 16th, the MICROSATs will be taken back to Lab in Boulder for further testing and to install "flight" cables. Then the four satellites will be taken back down to the Martin-Marietta plant and each of them will under go three axis vibration tests from September 19-22nd. The "shake" test, as it is commonly referred to in the aerospace industry, will simulate all the vibrations that the MICROSATs will see during launch. Once the vibration

tests are completed, further testing will be done at the MICROSAT Lab in Boulder to see how well each of the MICROSATs did during the vibration tests. Both of these tests, thermal vacuum and vibration, are required by Arianespace before the MICROSATs will be allowed to fly with the SPOT-2 satellite aboard the ARIANE IV rocket on November 10th.

This is the second time Martin-Marietta has offered the use of its test facilities to AMSAT. Many AMSAT members will remember that this was done three years ago when PHASE-3C (now known as OSCAR-13) went through final assembly and integration in the Denver area during the spring of '86. At that time Martin-Marietta provided the very same thermal vacuum test chamber so that all the subsystems on PHASE-3C could be tested.

AMSAT would like to again express its deepest appreciation for the continued support that Martin-Marietta has provided to the amateur radio satellite program over the past several years.

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SB ALL @ AMSAT $ANS-238.02
MICROSAT PROGRESS REPORT #6

HR AMSAT NEWS SERVICE BULLETIN 238.02 FROM AMSAT HQ
SILVER SPRING, MD AUGUST 26, 1989
TO ALL RADIO AMATEURS BT

MICROSATs Moving Toward Final Assembly & Integration For Full System Testing

With the September 9th thermal vacuum test only two weeks away, the AMSAT-NA MICROSAT Lab in Boulder, CO is a "hot-bed" of activity. Through out this week and culminating with the thermal vacuum test, AMSAT volunteers will be flying in from around the country to help complete the final assembly, integration, and testing of the four MICROSAT satellites. So great is the progress being made that almost any Progress Report issued by AMSAT HQ's will be out-dated very quickly. But there are several significant milestones which have been met recently which deserve to be mentioned.

1. All four of the 70cm receivers designed and built by Tom Clark (W3IWI) have arrived at the Lab this week and are ready to be integrated.

2. Last weekend at Qualcomm in San Diego, the first flight computer was completed and tested thanks to the "heroic" efforts of Bob McGwier (N4HY), Franklin Antonio (N6NKF), Tom Lafleur (KA6IQA), Mike Brock (WB6HHV), Skip Hansen (WB6YMH) and Harold Price (NK6K). Also present and working to get the first flight computer running was Lyle Johnson (WA7GXD) and Paul Williamson (KB5MU). A special "tiger-team" was flown in from Utah to Qualcomm that consisted of the Weber State University team of Chris Williams (WA3EPD) and software expert Bob Argyle. The Weber team brought the CCD camera module with them for checkout with the computer. This first computer was completely checked out and will be arriving sometime next week. The WEBERSAT CCD was also successfully tested and all the processing was being performed by the first "production" flight computer.

3. In the "make-shift" clean room in the MICROSAT Lab all the modules, solar panels are ready to be integrated into spacecraft. A lot of "odds-and-ends" hardware tasks are still being performed. All the antennas have been built and tested along with the matching networks that will go with them.

4. The DOVE transmitter instability was resolved through the "tireless" efforts of Jose Machao (LU7JCN) of AMSAT-LU. Jose has virtually "lived" in the MICROSAT Lab for the past ten months. Also, Jose has tested all the transmitters and declared them "ready for flight." Joining Jose until late into the night has been AMSAT-NA VP of Engineering, Jan King (W3GEY). Jan says that based on his experience with passed OSCAR satellite programs, this final "push" to get the satellites assembled, tested, and ready for shipping

is always the most "stressful" period.

5. All four of the Battery Charge Regulator (BCR) modules have been completed. This was a particularly difficult task for volunteers due to the small space size available to fit the eight batteries and the BCR circuit board into a 1.5 inch thick module. The BCR electronics was designed and built by Jon Bloom (KE3D) of the ARRL. The final testing of the BCR modules will be completed by this week. Special thanks goes to Larry Kayser (VE3PAZ) who supplied all the batteries to AMSAT-NA for the MICROSATs.

6. All the AART control boards have been completed and will be checked out by Chris Willams (WA3EPD).

7. The DOVE voice speech synthesizer hardware has been completed by N4HY, KB2CST, and KA2MOV. This hardware will be shipped to Boulder next week for integration into DOVE. N4HY has been also working on the voice software which needs to accompany the speech synthesizer.

8. The S-Band transmitters which were built by YT3MV have been integrated in to the "spare module" in DOVE and the AMSAT-NA PACSAT. The S-Band transmitters have been checked out and produce about 1 watt of RF output.

9. N4HY will travel to Boulder on August 27th to assist in the assembly and testing of the satellites; he also will be present throughout thermal vacuum testing. Bob will also be finalizing the MICROSAT software for commanding and monitoring the telemetry for the thermal vacuum testing at Martin-Marietta. Joining the volunteers in the Lab next weekend will be Junior De Castro (PY2BJO) of BRAMSAT who will be assisting during this critical phase of the MICROSAT testing.

In any Progress Report it is almost impossible to mention the names of every volunteer who has helped to contribute to the progress of the MICROSATs during any week. But AMSAT-NA truly appreciates all those who have volunteered their time and engeries to make the MICROSAT program possible. With the intensive testing period beginning soon, many a volunteer will be working long hours to help make the testing a success. The radio amateur community can proud of what these "tireless" volunteers have produced.

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SB ALL @ AMSAT $ANS-238.03
TENN BALLOON LAUNCH A SUCCESS

HR AMSAT NEWS SERVICE BULLETIN 238.03 FROM AMSAT HQ
SILVER SPRING, MD AUGUST 26,1989
TO ALL RADIO AMATEURS BT

Tennessee Balloon Launch Was A Great Success

Carl Lyster (WA4ADG) and David Fields (N4HB0) report that their first balloon experiment was launched from the Knoxville, TENN area on August 5th and the flight was very successful. Many will remember that two weeks before their balloon launch had to be "scrubbed" because of a faulty +5V regulator which was critical to the telemetry system. This balloon launch was particularly interesting because the 2M beacon contained a voice synthesizer reproducing the voice of Astronaut Neil Armstrong and the famous words he spoke as he stepped upon the lunar surface. Also, there was a beacon on 10M which sent out ASCII telemetry. The balloon was launched exactly as planned at 7:29 A.M. EDT on a beautiful sunny day. Assisting in the "pre-launch" net was WA3USG who ran the 40M phone net and received check ins from as far away as Michigan. It was estimated that the balloon carried its payload to an altitude of 90,000 ft. Stations as far way as 450 miles reported hearing the beacons. After one and half hours of flight, the balloon burst and it took almost 30 minutes for it to safely parachute to earth. Once the balloon burst, a Civil Air Patrol (CAP) plane carefully tracked its decent and kept the package in site until

the ground crew could reach the tree that the package landed in! Always an adventure, the ground-crew had to extract the balloon package from the top of a 70 ft tree. But with perserverance, the ground crew finally retrived the payload. With the success of this balloon experiment, WA4ADG and N4HBO are now planning their next experiment. Their next effort will be a 10M-to-2M translator which they hope to launch in about 2 months. AMSAT congratulates both Carl and David on their success.

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SB ALL @ AMSAT $ANS-237.06
AMSAT SHORT BURSTS

HR AMSAT NEWS SERVICE BULLETIN 237.06 FROM AMSAT HQ
SILVER SPRING, MD AUGUST 25, 1989
TO ALL RADIO AMATEURS BT

AMSAT Short Bursts

Bill McCaa (K0RZ) reports that the activity on the OSCAR-13 Mode S transponder is quite heavy. Many stations have been experimenting with QRP power on the 70cm uplink and have reported excellent signals using 2-3 watts from their Mode B antennas on CW. For SSB contacts, it takes about 10 watts of RF output from a good Mode B station. All OSCAR-13 users will be suprised at the excellent signals on Mode S, this according to K0RZ.

The following is the latest OSCAR-13 operating schedule. Please post this in a convenient place in your hamshack for quick reference.

AO-13 Transponder Schedule
16Aug89 until 16Nov89
BLON/BLAT 210/0

Mode B: MA 003 to MA 160
Mode JL: MA 160 to MA 200
Mode B: MA 200 to MA 240
Off: MA 240 to MA 003
Mode S: MA 210 to MA 222

Through the efforts of Sumio Nakane (JH3BJN), AMSAT-NA has received the following operating schedule for FUJI-OSCAR-12 for the next few months:

DATE	MODE	OPERATING PERIOD
09/02/89	JA	22:37 UTC until 06:49 UTC on 09/03/89
09/05/89	JA	21:57 UTC until 06:00 UTC on 09/06/89
09/08/89	JD	19:15 UTC until 03:27 UTC on 09/09/89
09/13/89	JA	18:48 UTC until 03:00 UTC on 09/14/89
	PLEASE NOTE:	NO FO-12 OPERATION FROM SEPT. 15TH TO SEPT. 25TH DUE TO SOLAR ECLIPSES!
09/26/89	JA	15:12 UTC until 23:24 UTC
09/30/89	JD	21:50 UTC until 12:44 UTC on 10/01/89
10/06/89	JD	20:29 UTC until 11:23 UTC on 10/07/89
10/10/89	JA	10:42 UTC until 18:54 UTC

de DB2OS 01May89: *** AO-10 TRANSPONDER SCHEDULE ***
14Jul89 to 01Sep89

Mode-B : from MA 000 to MA 255

WB6LLO suggest that those wishing to experiment with packet on AO-13 should look for him using PSK on the following frequencies:

Mode B-145.870 down, approx. 435.530 up

Mode J-435.950 down, approx. 144.460 up

WB6LLO mentions that if you are having difficulty "connecting" with him that you can meet him up 10 KHz for a voice contact, that is, on Mode B at 145.880 MHz or on Mode J at 435.960 MHz

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